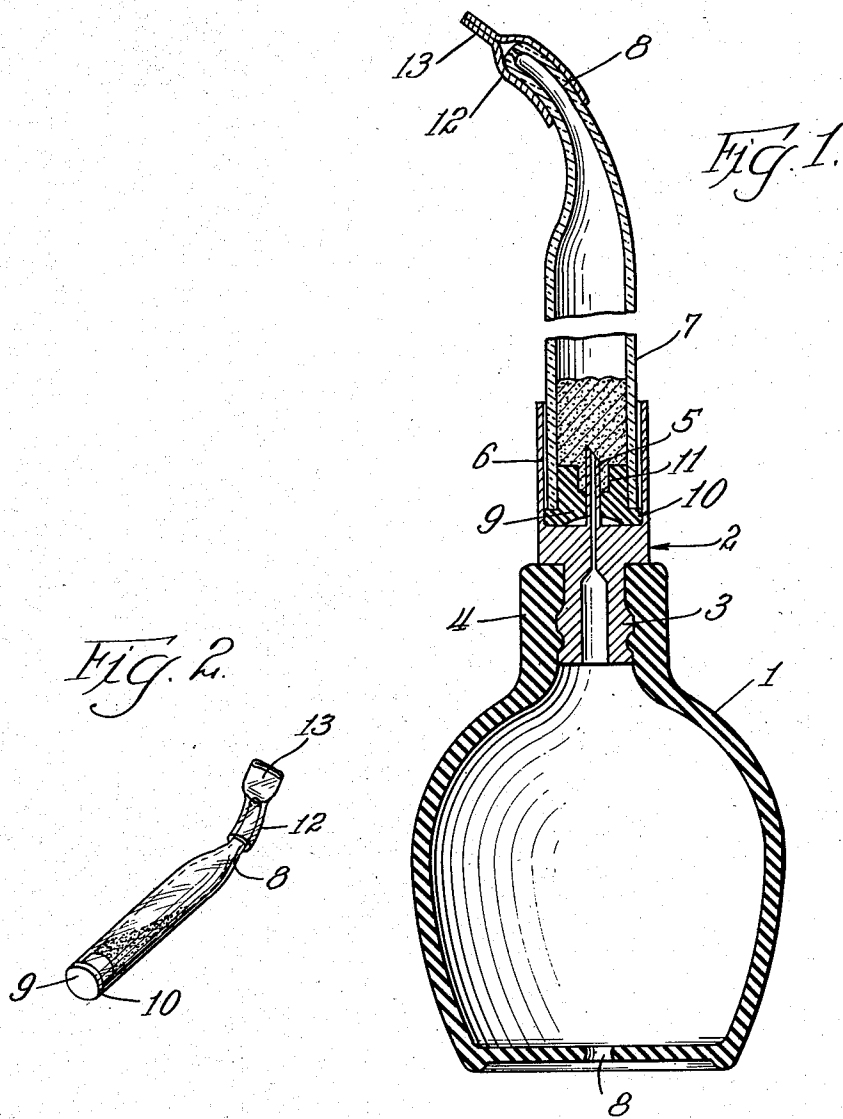


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STERILE MEDICAMENT INSUFFLATOR
CARTRIDGE AND INSUFFLATOR
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STERILE MEDICAMENT INSUFFLATOR
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1

This invention relates to a device for "frosting" an exposed, incised, or other surface with medicament; that is to say, a device for laying down a deposit of a medicament on a surface, usually for inhibiting the growth or spread of micro-organisms, bacteria, germs, and the like.

The device herein illustrated is designed primarily for the frosting of cavities remaining in the gums after extraction of teeth but it will be apparent that the device may be employed for other medicament applying purposes.

One of the important objects of the invention is to provide a convenient and practical means for facilitating the application of medicaments in sterile condition, and especially to provide means whereby penicillin, which may be produced in sterile form but which may not be subjected to known sterilizing processes, may be applied in sterile form and under sterile conditions.

Other objects of the invention are to provide a simple insufflating device and a cartridge therefor which may be a single use cartridge; to provide an insufflator and cartridge which may be readily assembled and disassembled; to provide a cartridge which may be produced in sterile condition and delivered to the dentist or other user in such sterile condition so as to be immediately ready for use without preliminary sterilization or other treatment by the user; to provide a method for producing a sterile cartridge containing a penicillin preparation in sterile form; and other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawing.

In the drawing,

Fig. 1 is a section through an assembled insufflator and cartridge embodying a selected form of the invention, and

Fig. 2 is a perspective illustrating the sterile cartridge.

The insufflator shown in the drawing comprises a rubber or similar compressible resilient bulb 1 which constitutes a source of compressed air when the bulb is collapsed under manual pressure. A compressed air conduit 2 has a nipple portion 3 suitably seated and gripped in the outlet end portion 4 of the bulb, said conduit having at its other end a hollow or hypodermic needle extension 5. A collar 6 is also provided in surrounding relation to the needle 5, preferably concentric therewith. Said collar 6 is adapted to position a cartridge 7 in such position that the needle 5 may penetrate an end of the cartridge

2

prepared for that purpose as will presently be explained. The collar 6 accordingly preferably extends somewhat beyond the sharpened end of the needle 5 as shown.

The free end of the bulb 1 is equipped with an opening 8 which may be suitably valved to permit air to enter the bulb while preventing air from escaping from the bulb, but said opening is preferably left unvalved as shown.

The cartridge 7 comprises a length of cylindrical glass tubing having a discharge end 8 tapered to a reduced diameter and preferably curved approximately as illustrated. The other end of the cartridge tube is adapted to be closed by a rubber or similar stopper 9 having a flange 10 designed to limit the extent to which the stopper may be inserted in the tube. The stopper may also have its inner end recessed as indicated at 11 so as to reduce the thickness of the stopper through which the needle 5 must be passed to reach the inside of the cartridge. It will be evident from an inspection of Fig. 1 that the collar 6 of the insufflator effectively positions the cartridge relative to the needle 5 so that the needle will be caused to penetrate the reduced thickness portion of the stopper.

The frictional gripping effect of the rubber stopper 9 on the needle 5 is sufficient to hold the cartridge 7 in assembled relation to the insufflator and the collar 6 is accordingly preferably made a free fit around the cartridge 7. While the fit of the cartridge is here characterized as a free fit in the collar 6, it is nevertheless preferably such that the collar will also help to prevent objectionable wobbling of the cartridge on the end of the insufflator so that the doctor or other user of the device should have no difficulty in holding the discharge end of the cartridge in the desired location. It may also be observed that while the cartridge may readily be rotated to any position desired on the needle 5, the frictional gripping effect of the stopper on the needle normally prevents such rotation.

The discharge end 8 of the cartridge is initially closed in any suitable manner. In this instance, a cap 12 is shown fitting snugly over the discharge end portion of the cartridge. Said cap 12 may conveniently and practicably be formed from a length of tubing of any suitable material, such as synthetic rubber composition, and other materials which may be sterilized without deterioration by the same processes employed for sterilizing the glass tube of the cartridge 7; such material is flexible and somewhat elastic so that it may be slightly stretched when

applied to the discharge end 8 of the cartridge so as to be thereby effectively retained by friction; and it is sealable by the application of pressure or heat or both so that an end portion of a length of such tubular material may be closed to form a sealed end 13 of the cap as shown. Several materials of the character indicated are commercially available. They are generally of the vinyl-resin classification.

As indicated, the cap 12 is formed from a length of tubing of the selected material which is slightly less in internal diameter than the external diameter of the discharge end portion of the cartridge tube. Hence, when the cap is applied it will be slightly stretched and caused to effectively grip the tube so as to retain itself in place until removed by the positive action of the user.

An insufflator cartridge of the character described is desirably charged with a mixture of certain sulpha powders and penicillin powder for use by dentists and others. The cartridge should, of course, be in sterile condition when the dentist or other doctor places it in use. The parts of the cartridge and sulpha powders, such as are employed may be easily sterilized but the penicillin may not be practicably sterilized by any known method. In order to provide a sterile cartridge, the glass cartridge tube with the cap 12 thereon and the rubber stopper separated from the cartridge and the sulpha powders may be subjected to conventional sterilizing processes.

The penicillin is produced in sterile form and is handled under sterile conditions and added to the sterilized sulpha powders to produce the desired formula. The sterile cartridge tube closed by the cap 12 is then filled with the desired amount of the mixed powders and the stopper 9 applied, these operations being effected under sterile conditions so as to maintain the sterility of all parts. Under these conditions, at least the interior of the cartridge tube and its content together with the interior surfaces of the stopper 9 and cap 12 will remain sterile even though the cartridge is handled and the sterility of its exterior surfaces impaired. However, the exterior surface of the discharge end portion 8 of the cartridge will be maintained sterile by the cap 12 so that when the cap is removed a sufficient length of the discharge end portion of the cartridge remains sterile on its outer surface so as to avoid any danger of contamination of the cavity or incision into which the discharge end portion 8 is projected.

To eject the medicament from the cartridge, the doctor grips the insufflator bulb in such a manner that his thumb may conveniently close the opening 8 in the bulb whereupon the bulb is collapsed or compressed to deliver a charge of compressed air into the cartridge through the needle 5, such compressed air serving to pick up and carry with it out through the discharge end of the cartridge a load of the powdered medicament contained in the cartridge. Upon releasing the thumb from the end of the bulb 4, the opening is uncovered and air permitted to enter the bulb whereupon its normal resiliency will re-expand it to its initial condition. The freedom with which air may enter the unvalved opening facilitates expansion of the bulb without sucking air reversely into the cartridge through its discharge end. Thus repeated blasts of the medicament from the cartridge may be employed without danger of seriously impairing the sterility of the medicament remaining in the cartridge.

While a valve may be provided in the opening 8 as already explained, it is preferred that such valve be omitted since the unvalved opening permits a freer entrance of air into the bulb as already mentioned. Also, it often occurs that valves of the character employed in bulbs of this type become gummed up from one cause or another thereby interfering with its free action which would further impair the satisfactory operation of the described insufflator.

Changes may be made without departing from the invention as typified by the described structure.

I claim:

1. Apparatus for insufflating medicinal powder comprising the combination of a resilient material bulb having air inlet and outlet openings, a fitting having a body portion and nipple and collar portions respectively extending in opposite directions from said body portion, said nipple portion being seated in said outlet opening of said bulb whereby said fitting is attached to said bulb, a hollow needle rigid with said body, communicating with the inside of said bulb through said nipple and extending within said collar in the same direction from said body as said collar, and a medicinal powder cartridge adapted to be detachably connected to said bulb through the agency of said fitting, said cartridge comprising a chamber section having a base portion of outside diameter fitting telescopically inside of said collar so as to be thereby positioned and supported, and a nozzle section integral with and extending from said chamber section and tapering from the latter to a reduced diameter outlet end portion, a closure plug in said base portion, said plug being of resilient, compressible material which is puncturable by said needle and of a thickness which is less than the length of said needle so as to be adapted to be completely penetrated by said needle as an incident to the telescoping of the cartridge into said collar, thereby to establish communication between said bulb and the interior of said cartridge through said needle, and a cap removably seated on and enclosing the outlet end portion of said nozzle section of the cartridge.

2. Apparatus for insufflating medicinal powder comprising the combination of a resilient material bulb having air inlet and outlet openings, a fitting having a body portion and nipple and collar portions respectively extending in opposite directions from said body portion, said nipple portion being seated in said outlet opening of said bulb whereby said fitting is attached to said bulb, a hollow needle rigid with said body, communicating with the inside of said bulb through said nipple and extending within said collar in the same direction from said body as said collar, and a medicinal powder cartridge adapted to be detachably connected to said bulb through the agency of said fitting, said cartridge comprising a chamber section having a base portion of outside diameter fitting telescopically inside of said collar so as to be thereby positioned and supported, and a nozzle section integral with and extending from said chamber section and tapering from the latter to a reduced diameter outlet end portion, a closure plug in said base portion, said plug being of resilient, compressible material which is puncturable by said needle and of a thickness which is less than the length of said needle so as to be adapted to be completely penetrated by said needle as an incident to the telescoping of the cartridge into said collar,

5

thereby to establish communication between said bulb and the interior of said cartridge through said needle, said collar being of greater length than said needle so as to be operative to position said base portion of the cartridge relative to said needle before said plug engages said needle, and a cap removably seated on and enclosing the outlet end portion of said nozzle section of the cartridge.

MACK R. FIELDS. 10

6

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